

What Is Claimed Is:

1 1. A method of processing multi-protocol label switching (MPLS) packets in a
2 MPLS device, said method comprising:
3 receiving a configuration data identifying a group of multi-labeled packets and a
4 corresponding desired EXP value for a stack entry at a low level for said group of multi-
5 labeled packets;
6 receiving a multi-labeled packet containing a data packet and a plurality of stack
7 entries including a low stack entry at said low level;
8 determining whether said multi-labeled packet falls in said group;
9 setting EXP bits of said low stack entry to said corresponding desired value if said
10 multi-labeled packet falls in said group; and
11 forwarding said multi-labeled packet containing said desired value in EXP bits in
12 said low stack entry.

1 2. The method of claim 1, wherein said MPLS device comprises an autonomous
2 system border router (ASBR) located at an edge of a network managed by a service
3 provider, wherein said service provider controls service levels in forwarding said multi-
4 labeled packet further down a path by setting said EXP bits.

1 3. The method of claim 2, wherein said group of multi-labeled packets are
2 identified by a value in EXP bits of a specific stack entry, wherein said determining
3 comprises examining said multi-labeled packet as received for said value in EXP bits of

4 said specific stack entry.

1 4. The method of claim 1, wherein said data packet is received in the form of
2 Internet Protocol (IP).

1 5. A machine readable medium carrying one or more sequences of instructions for
2 causing a multi-protocol label switching (MPLS) to process packets, wherein execution
3 of said one or more sequences of instructions by one or more processors contained in said
4 MPLS device causes said one or more processors to perform the actions of:

5 receiving a configuration data identifying a group of multi-labeled packets and a
6 corresponding desired EXP value for a stack entry at a low level for said group of multi-
7 labeled packets;

8 receiving a multi-labeled packet containing a data packet and a plurality of stack
9 entries including a low stack entry at said low level;

10 determining whether said multi-labeled packet falls in said group;

11 setting EXP bits of said low stack entry to said corresponding desired value if said
12 multi-labeled packet falls in said group; and

13 forwarding said multi-labeled packet containing said desired value in EXP bits in
14 said low stack entry.

1 6. The machine readable medium of claim 5, wherein said MPLS device
2 comprises an autonomous system border router (ASBR) located at an edge of a network

3 managed by a service provider, wherein said service provider controls service levels in
4 forwarding said multi-labeled packet further down a path by setting said EXP bits.

1 7. The machine readable medium of claim 6, wherein said group of multi-labeled
2 packets are identified by a value in EXP bits of a specific stack entry, wherein said
3 determining comprises examining said multi-labeled packet as received for said value in
4 EXP bits of said specific stack entry.

1 8. The machine readable medium of claim 5, wherein said data packet is received
2 in the form of Internet Protocol (IP).

1 9. A MPLS (multi-protocol label switching) device processing MPLS packets,
2 said MPLS device comprising:

3 a memory storing a configuration data identifying a group of multi-labeled packets
4 and a corresponding desired EXP value for a stack entry at a low level for said group of
5 multi-labeled packets;

6 an inbound interface receiving a multi-labeled packet containing a data packet and
7 a plurality of stack entries including a low stack entry at said low level;

8 a label processing block determining whether said multi-labeled packet falls in said
9 group and setting EXP bits of said low stack entry to said corresponding desired value if
10 said multi-labeled packet falls in said group; and

11 an outbound interface forwarding said multi-labeled packet containing said desired

12 value in EXP bits in said low stack entry.

1 10. The MPLS device of claim 9, wherein said MPLS device comprises an
2 autonomous system border router (ASBR) located at an edge of a network managed by
3 a service provider, wherein said service provider controls service levels in forwarding
4 said multi-labeled packet further down a path by setting said EXP bits.

1 11. The MPLS device of claim 10, wherein said group of multi-labeled packets
2 are identified by a value in EXP bits of a specific stack entry, wherein said label
3 processing block examines said multi-labeled packet as received for said value in EXP
4 bits of said specific stack entry.

1 12. The MPLS device of claim 9, wherein said data packet is received in the form
2 of Internet Protocol (IP).

1 13. A MPLS (multi-protocol label switching) device processing MPLS packets,
2 said MPLS device comprising:

3 means for receiving a configuration data identifying a group of multi-labeled
4 packets and a corresponding desired EXP value for a stack entry at a low level for said
5 group of multi-labeled packets;

6 means for receiving a multi-labeled packet containing a data packet and a plurality
7 of stack entries including a low stack entry at said low level;

8 means for determining whether said multi-labeled packet falls in said group;
9 means for setting EXP bits of said low stack entry to said corresponding desired
10 value if said multi-labeled packet falls in said group; and
11 means for forwarding said multi-labeled packet containing said desired value in
12 EXP bits in said low stack entry.

1 14. The MPLS device of claim 13, wherein said MPLS device comprises an
2 autonomous system border router (ASBR) located at an edge of a network managed by
3 a service provider, wherein said service provider controls service levels in forwarding
4 said multi-labeled packet further down a path by setting said EXP bits.

1 15. The MPLS device of claim 14, wherein said group of multi-labeled packets
2 are identified by a value in EXP bits of a specific stack entry, wherein said means for
3 determining examines said multi-labeled packet as received for said value in EXP bits of
4 said specific stack entry.

1 16. The MPLS device of claim 13, wherein said data packet is received in the
2 form of Internet Protocol (IP).

1 17. A provider network containing:
2 a MPLS (multi-protocol label switching) device processing MPLS packets, said
3 MPLS device comprising:

4 a memory storing a configuration data identifying a group of multi-labeled
5 packets and a corresponding desired EXP value for a stack entry at a low level for
6 said group of multi-labeled packets;
7 an inbound interface receiving a multi-labeled packet containing a data
8 packet and a plurality of stack entries including a low stack entry at said low level;
9 a label processing block determining whether said multi-labeled packet falls
10 in said group and setting EXP bits of said low stack entry to said corresponding
11 desired value if said multi-labeled packet falls in said group; and
12 an outbound interface forwarding said multi-labeled packet containing said
13 desired value in EXP bits in said low stack entry.

1 18. The provider network of claim 17, further comprising an edge device
2 receiving said multi-labeled packet from a private network and forwarding said multi-
3 labeled packet to said MPLS device.

1 19. The provider network of claim 18, wherein said MPLS device comprises an
2 autonomous system border router (ASBR) located at an edge of a network managed by
3 a service provider, wherein a service provider controls service levels in forwarding said
4 multi-labeled packet further down a path by setting said EXP bits.

1 20. The provider network of claim 19, wherein said group of multi-labeled packets
2 are identified by a value in EXP bits of a specific stack entry, wherein said label

3 processing block examines said multi-labeled packet as received for said value in EXP
4 bits of said specific stack entry.

1 21. The MPLS device of claim 19, wherein said data packet is received in the
2 form of Internet Protocol (IP).

1 22. The provider network of claim 19, further comprising a plurality of core
2 devices to forward said multi-labeled packet from said edge device to said ASBR.